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THE CANADIAN SPECIES OF TRIMEROTROPIS.

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As only three specimens of *Trimerotropis*, Stal, have been reported from Canada, and as the writer has taken several others, of which three seem to be undescribed, the present paper may be of some value as a preliminary notice of the Canadian species of this genus.

The following table will serve to distinguish the species of *Trimerotropis* known to occur in Canada. It is artificial, but as the species enumerated are few, the table will perhaps be of greater service than would a more natural one. In the notes following the table the species are arranged according to McNeill's recent "Revision of the Orthopteran Genus *Trimerotropis*," the new species being placed according to their nearest affinities.

Key to the Canadian Species of Trimerotropis.

- A¹ Hind tibiae red, tegmina crossed by bands which may be conspicuous or faint on account of the slight contrast between them and the ground colour.
- a¹ Disk of the metazone of the pronotum plainly lighter than the prozone. Bands of tegmina distinct, but formed by the segregation of numerous small spots.....3. *monticola*, Sauss.
- a² Disk of the metazone not distinctly lighter than the prozone.
- b¹ Bands of the tegmina conspicuous, solid, and not formed by a segregation of small spots; process of the metazone acute.....4. *Bruneri*, McNeill.
- b² Bands of the tegmina inconspicuous, and made up of fuscous annuli; process of metazone obtuse.....5. *citrina*, Scudd.
- A² Hind tibiae never red.
- a¹ Hind tibiae blue. Bands of tegmina conspicuous, but made up of fuscous spots. Fuscous band of the wing very narrow2. ? *caeruleipes*, Scudd.

a² Hind tibiæ green or yellow. Bands of tegmina variable.

b¹ Lower sulcus of hind femora light, with two dark bands.

c¹ Tegmina long and narrow, the bands obsolete or represented by irregular groups of segregated spots. Hind tibiæ yellowish. Antennæ of male shorter than hind femora . . . 1. *maritima*, Harris.

c² Tegmina of ordinary length and width, the bands conspicuous, the basal and median being solid. Hind tibiæ green. Antennæ of male longer than hind femora 6. *longicornis*, n. sp.

b² Lower sulcus of hind femora black, with one preapical light band.

c¹ Spur of the fuscous band of the wing extending about half-way to the base. Tegmina either with distinct bands, or when this is not the case, not sprinkled throughout with fuscous annuli.

d¹ General colour light or dark brown, much varied with fuscous. Area of the cubital forks in ♀ occupied by several rows of cubical cells. Tegmina always crossed by well-defined bands. 7. *vinculata*, Scudd.

d² General colour ash-gray, varied with brown and white. Area of the cubital forks in both sexes occupied, at least in the basal part, by a single row of cubical cells. Tegmina variable; bands usually poorly developed, often entirely absent, but sometimes well

defined 8. *huroniana*, n. sp.

c² Spur of the fuscous band of the wing extending very nearly to the base. Tegmina sprinkled with fuscous annuli, which show very little, if any, tendency to form bands . . 8. *sordida*, n. sp.

1. *Trimerotropis maritima*, Harris.

Locusta maritima, Harris, Ins. Inj. to Veg., 1841, p. 178.

Oedipoda maritima, Scudd., Mat. Mon. N. A. Orth., 1862, p. 472.

Trimerotropis maritima, Stal, Recens. Orth., I., 1873, p. 135.

This species is found plentifully in Southern Ontario, along the shores of the great lakes, occurring in a form somewhat different from the typical one of the Atlantic Coast, and to which I have given the racial name, *interior* (CAN. ENT., XXX., 262).

McNeill's description of *maritima* in his recent Revision (p. 450) seems to have been based entirely upon specimens from the Atlantic Coast, and it does not fit *interior* in all respects. The width of the wing-band in the latter is often nearly one-fourth the length of the wing, whereas McNeill states that it is never as much as one-sixth; and the tegmina of *interior* often show distinct traces of three bands, which fact is also contrary to McNeill's description. Moreover, the measurements given are much too large for the race *interior*, although the latter is very variable in size. Accordingly, I give the following measurements taken from Ontario specimens:

Length of body, ♂ 19 to 22 mm., ♀ 26 to 30 mm.

Length of tegmen, ♂ 19 to 24 mm., ♀ 27 to 31 mm.

Length of hind femora, ♂ 11 to 12 mm., ♀ 13.5 to 15.5 mm.

I have specimens from the following localities: Toronto Id., July-Sept.; Rond Eau, Sept. 14, 1899; Point Pelee, Aug. 7, 1901; Kingsville, Aug. 13, 1897; Walpole Id., St. Clair River, Aug. 13, 1901; Southern extremity of Lake Huron, near Sarnia, Aug. 12 and 14, 1901.

2. *Trimerotropis ?cæruleipes*, Scudd.

Trimerotropis cæruleipes, Scudd., 2nd Rept. U. S. Ent. Com., App. 11, 1880, p. 27.

Mr. Scudder, to whom I sent a specimen of this insect for determination, replied that it was "apparently a new species near *cæruleipes*, or else that species, which is very variable," and remarked that he had a specimen like mine from Yellowstone Park. My specimens are from Discovery Id., near Victoria, B. C., Sept. 6, 1897; Nanaimo and Duncan's, Vancouver Id., Sept. 7, 1897. It is a very common insect on Vancouver Island, in both rocky and sandy districts. I found it in great numbers on Discovery Id., one of the numerous small islands near Victoria. Here it flew with a swift, low flight about the bare rocks in the more open places, the males producing a very rapid crepitation.

3. *Trimerotropis monticola*, Sauss.

Trimerotropis monticola, Sauss., Prodr. (Edip., 1884, p. 170.

This is the most abundant species of the genus on the dry plains of Assiniboia. It bears an extraordinarily close resemblance to one of the

commonest forms of *Spharagemon collare*, Scudd., which is met with in the same situations. It can be distinguished at once, however, by the two-notched median carina, the *Spharagemon* having but one.

I have specimens from Moose Jaw, Ass'a, Aug. 30, 1897; near Waldeck, Ass'a, Aug. 30, 1897; near Gull Lake, Ass'a, Aug. 30, 1897; Swift Current, Ass'a, Sept. 20, 1897; Morse, Ass'a, Sept. 20, 1897; Vernon, B. C., Sept. 10, 1897.

4. *Trimerotropis Bruneri*, McNeill.

Hadrotettix gracilis, Bruner, MSS.

Trimerotropis Bruneri, McNeill, Proc. U. S. Nat. Mus., XXIII, 1901, p. 423.

I have a single male of this species, taken at Swift Current, Ass'a, Sept. 20, 1897.

5. *Trimerotropis citrina*, Scudd.

Trimerotropis citrina, Scudd., Bull. U. S. Geol. Surv. Terr., II., 1876, p. 265.

I have seen no Canadian specimens of this form, but it has been reported by Scudder from Manitoba.

6. *Trimerotropis longicornis*, new species. (Pl. I., figs. 1-4.)

♂. Of medium size, dull grayish-brown, paler beneath. Head of average size, ash-gray below the ocellus, infuscated above. Face evenly but rather sparsely and indistinctly punctate throughout. Occiput considerably elevated above the pronotum, evenly convex, dark grayish-brown. Scutellum a little longer than broad, strongly sulcate, limited in front by a V-shaped depression. Median carina present, but faint. Lateral carina well marked, forming a very obtuse and somewhat rounded angle opposite the anterior margin of the eyes, from which they converge to meet the frontal costa. Lateral foveolæ triangular, rather large and shallow. Frontal costa failing by some distance to reach the clypeus, sulcate at and for a short distance below the ocellus, where it is slightly expanded; above the ocellus plane and evenly punctate. Lateral carinae of the face reaching the clypeus, but not prominent. Eyes moderately prominent, about as long as the genal groove. Antennæ surpassing the hind femora by about one-fourth the length of the latter. Pronotum dark grayish-brown, rather short. Greatest width of disk about seven-eighths of the length. Prozone somewhat elevated and tectiform, three-fifths as long as the metazone. Disk of metazone much lighter than the

prozone, being pale grayish-brown, finely granulose with a few small scattered black tubercles; process very slightly obtusangulate, the sides straight and the tip scarcely rounded. Median carina slightly cristate on the front part of the metazone, but gradually fading behind into a mere raised line, cristate and prominent on the prozone, and distinctly bilobate, the anterior lobe about twice as long as the posterior, the posterior notch much more prominent than the anterior. Lateral carinæ distinct only on the front part of the metazone. Tegmina of ordinary length and width. Area of cubital forks occupied by two or three rows of irregular cells. Markings of tegmina very like those of *T. vinculata*; inner third occupied by a solid dark brown band, with a well-defined unbroken margin, beyond which are two others of the same colour, a solid median band about half as wide as the basal, and a still narrower, somewhat irregular and broken band between the outer and middle thirds of the tegmen. These bands are separated by light brown bands of about the same width as the median band. Apical third semi-transparent, with a few scattered dark brown spots. Wings with the disk light yellow, apical portion infuscated at tip, the hyaline area rather limited in extent, and not definitely separated from the rather narrow fuscous band which crosses the wing slightly beyond the middle and does not reach the anal angle. Spur extending half way to the base. Hind femora externally grayish-brown, with a pale yellow preapical annulus and crossed by two dark brown, not very well defined, bands; internally the disk, inner, and upper sulci, are light yellow, crossed by two black bands. Hind tibiæ light green, with a pale yellowish sub-basal annulus.

Length of body, 21 mm.; length of antennæ, 14.5 mm.; length of head and pronotum, 7 mm.; length of tegmen, 22 mm.; length of hind femora, 11.5 mm.

Described from one male, Vernon, B.C., Sept. 10, 1897. I have another specimen, also a male, taken on the same date at the same locality, which I feel pretty sure belongs to this species, but differs so much in the character of the wing-band and in several less important points that I have hesitated to place them together. In this specimen the width of the fuscous band in its widest part is equal to fully one-fourth the length of the wing, it crosses the middle of the wing in the usual way, its outer margin is well defined, and the apical portion of the wing is hyaline, with only the slightest trace of infuscation at the apex. The antennæ are

somewhat shorter, but are still longer than the hind femora, the pronotum slightly longer, the greatest width of the disk being about four-fifths the length. All these points, with the exception of the character of the wing-band, might easily be due to individual variations, and in all other respects the specimens agree closely, so that the species is probably very variable in the markings of the wings.

T. longicornis seems to approach *T. salina*, Bruner, but I have not seen the latter species.

7. *Trimerotropis vinculata*, Scudd. (Pl. I., figs. 5-7.)

Trimerotropis vinculata, Scudd., Ent. Notes, V., 1875-76, p. 25.

Trimerotropis cincta, Sauss., Prodr. (Edip., 1884, p. 171.

I have specimens of this species from Agassiz, B. C., Sept. 9, 1897; Vernon, B. C., Sept. 10, 1897; Revelstoke, B. C., Sept. 19, 1897. I found it very common at Vernon in dry, open places, but at each of the other localities I took but a single specimen.

It has also been reported by Dr. Fletcher from Victoria, B. C. (Rep. Exp. Farms Can., 1888, 63).

8. *Trimerotropis huroniana*, new species. (Pl. I., figs. 8-13.)

Of medium or rather small size; pale ashy gray, varied with brown and white; in its general colour and maculation much resembling *T. maritima*, race *interior*.

Head of the ordinary size, pale ash-gray or nearly white, faintly mottled with darker gray. Occiput considerably (♂), very slightly (♀), elevated above the level of the pronotum, nearly smooth; brownish fuscous, with paler grayish mottlings, especially externally, where they form a pale postocular band continuous along the margin of the disk of the pronotum, with a more or less distinct band of the same colour. Below this pale band there is more or less indication of a grayish fuscous postocular band, more distinctly defined above than below, where it merges into the grayish mottlings of the genæ. Scutellum longer than broad (♂), about as long as broad (♀), strongly sulcate, limited in front by a V-shaped depression; median carina usually distinct, especially anteriorly, sometimes nearly obsolete. Lateral carinæ sharp, lighter in colour than the disk, extending and slightly diverging from a point opposite the middle of the eye to the front margin of the eye, where they form a marked angle, and whence they converge, keeping a fairly straight course, to meet the frontal costa. Lateral foveolæ rather small, triangular, moderately deep. Frontal

costa deeply sulcate throughout, considerably expanded at the ocellus, above and below which it is constricted, the sides below the lower constriction diverging as they approach the clypeus, which they fail to reach. Lateral carinae of the face moderately prominent, reaching the clypeus, but less marked in the upper than in the lower portion. Eyes moderately prominent, as long as the genal groove (δ), distinctly shorter (φ). Antennae about four-fifths (δ) or five-sevenths (φ) as long as the hind femora, grayish brown, slightly darker apically. Pronotum expanding moderately on the metazone, posterior margin rectangulate, the angle but little rounded. Greatest width of disk about four-fifths (δ) or five-sixths (φ) of the length. Prozone not more than half as long as the densely-punctate metazone; the latter gently convex antero-posteriorly and very broadly convex transversely. Median carina a raised line on the metazone, feebly cristate on the prozone, the anterior lobe nearly twice as long as the posterior, the notches, especially the anterior, rather shallow. Lateral carinae distinct only on the anterior part of the metazone. Sides of the pronotum with two whitish spots, the upper extending across, the whole of the prozone, the lower between the two posterior sulci. A dark brown spot separates these, and extends to the anterior margin of the prozone. Tegmina rather long, but of average width, quite like those of *T. vinculata* in form, extremely variable in markings, sometimes being as strongly banded as average specimens of *vinculata*, sometimes perfectly immaculate, with an ill-defined clouding of the basal fourth. Ground colour ashy or light brownish gray, in average specimens with distinct indications of bands, a basal one occupying the basal third or fourth, and a median band generally represented by an irregular but fairly solid spot. Apical third semitransparent, often immaculate, but generally with a variable number of scattered spots, which only in very distinctly marked specimens form any semblance of a band. Wings very similar to those of *vinculata*, slightly less than twice as long as broad. Disk very pale yellow. Fuscous band nearly equal, with both inner and outer margins arcuate; width about one-sixth, or a little more, the length of the wing; the spur extending about half way to the base. Apical portion of wing hyaline, immaculate; many of the veins whitish. Outer face of hind femora very light gray, with a pale yellowish preapical band, and with more or less distinct indications of a basal transverse fuscous band, and median and post-median oblique bands, these bands being generally well

marked in the ♂, but often indistinct in the ♀. Disk of the inner face black, with two light bands, a median and a preapical; the upper sulcus with an additional light band near the base; lower sulcus black, with one preapical light band. Hind tibiae pale yellow.

Length of body, ♂ 20 mm., ♀ 27 mm.

" " antenna, ♂ 10 mm., ♀ 9.5 mm.

" " head and pronotum, ♂ 7 mm., ♀ 8.5 mm.

" " tegmen, ♂ 22 mm., ♀ 27 mm.

" " hind femora, ♂ 11 mm., ♀ 13 mm.

Described from twenty-one ♂♂, fifteen ♀♀, Southampton, Ont. Aug. 20, 21 and 29, 1901.

This species is closely allied to *T. vinculata* and *T. saxatilis*, McNeill, but I am satisfied that it is distinct from both. Mr. Scudder, to whom I sent a pair, gave his opinion that they agreed slightly better with McNeill's description of *saxatilis* than with *vinculata*, but was unable to decide whether it should be referred to the former or not. I tried to obtain specimens of *saxatilis* for comparison, but was unsuccessful. Nevertheless, after comparing my series with McNeill's rather brief description of *saxatilis*, I find that there are points of difference that seem to be constant. These are as follows:

In *saxatilis* the metazone of the pronotum is not more than one and three-quarter times as long as the prozone; in *huroniana* it is in every specimen in my series fully twice as long as the prozone, and sometimes slightly more. In *saxatilis* the tegmina, though variable, are usually very strongly varied with fuscous, and when nearly plain it is by the suffusion of the ground colour with fuscous. In *huroniana* the tegmina are only occasionally strongly varied with fuscous, and when plain it is not through suffusion, but merely from absence of the bands; in other words, it is the darker specimens of *saxatilis* that have plain tegmina, whereas it is the lighter specimens of *huroniana*. The wings in *saxatilis* are relatively shorter than in *vinculata*, being considerably less than twice as long as broad. In *huroniana*, on the other hand, they are identical in form with those of *vinculata*, and the wing-band is as narrow as in that species, whereas it is broader in *saxatilis*.

It may also be mentioned that *saxatilis* in Arkansas is found only on rocky ground, whereas *huroniana* avoids rocks, being like *T. maritima*, partial to the sandy beaches, close to the water's edge.

From *vinculata*, besides differing in colour and markings, *huroniana* has a more deeply sulcate frontal costa, never being plane above the ocellus, and the area of the cubital forks of the wings is narrower, containing even in the ♀ but a single row of cubical cells in at least the basal portion.

This species is particularly interesting, as it seems to replace *T. maritima* on the northern part of the east shore of Lake Huron. In the vicinity of Southampton there is a limited extent of wide, sandy beach, north of which the shore is continuously rocky. On this beach *huroniana* is to be found under very similar but more boreal conditions to those under which *maritima* is found further south.

In flight it is extremely alert, and its stridulation is peculiar, being a very rapid but not loud crepitation, interrupted about thrice in a second, so that at a little distance it seems to be composed of separate notes. Usually three, sometimes four of these, are produced at a time.

9. *Trimerotropis sordida*, new species. (Pl. I., figs. 14-18.)

Of medium or rather small size, uniform dull pale grayish-brown, showing very little contrast in the markings of the body and tegmina. Head light brownish, more or less faintly mottled and punctate with a darker and more grayish colour. Occiput barely or not at all elevated above the pronotum, somewhat roughened, slightly darker than the face. Scutellum fully as broad as long, strongly sulcate; the median carina usually distinct for some distance backwards on the occiput, and limited in front by a slight V-shaped ridge, in front of which is a more or less marked depression. Lateral carinae prominent and sharp, diverging to a point opposite the front margin of the eyes, where they form a marked angle, thence converging in a distinctly incurved course to meet the frontal costa. Lateral foveolae large, subtriangular, moderately depressed. Frontal costa very strongly sulcate throughout, constricted above and below the ocellus; the sides below the lower constriction gently diverging until they meet the clypeus. Lateral carinae of the face reaching the clypeus, strongly bent, very prominent and equally so throughout. Eyes moderately prominent, but not large, being even in the ♂ distinctly shorter than the genal groove. Antennae about four-fifths (♂) or three-quarters (♀) as long as the hind femora, grayish-brown, darker apically. Pronotum of ordinary length, moderately expanded on the metazone. Process of metazone rectangulate or slightly acutangulate, sides straight, angle scarcely rounded. Greatest

width of disk four-fifths (δ), eight- or nine-tenths (φ), the length. Prozone considerably contracted, with the disk rather more than ordinarily wrinkled, as long as or slightly shorter than half the length of the somewhat coarsely granulated metazone, the latter slightly convex both antero-posteriorly and transversely. Median carina prominent throughout, strongly cristate and bilobate on the prozone, the posterior notch especially deep and somewhat oblique; cristate on the anterior part of the metazone. Lateral carinae very sharp and prominent on the metazone, continued forward a short distance on the posterior part of the prozone. They are also present to a variable extent on the anterior part of the prozone. Tegmina rather long, of moderate width, pale dull brownish, sprinkled throughout with grayish fuscous annuli, which form a more or less distinct group occupying the basal third or fourth, and also show a tendency to collect in the middle of the tegmen, but do not form anything that could be called a band. Area of the cubital forks rather narrow, usually occupied by two or three rows of irregular cells, or, as in one δ which I have, by a single row of cubical cells. Wings fully three-fifths as wide as long; disk pale yellow; fuscous band crossing about the middle of the wing not reaching the anal angle, the outer margin less curved than the inner, so that the band is considerably wider where it meets the outer margin of the wing than it is at the costal margin. Greatest width of band varying from one-fourth to slightly more than one-third the length of the wing. Spur extending very nearly to the base. Apical portion of the wing hyaline, with a few fuscous spots near the apex in the δ , none of the veins whitish. Outer face of the hind femora plain grayish-brown, or with faint indications of darker bands; inner face black, with two light bands, a median and a preapical, the upper sulcus with an additional light band near the base; lower sulcus black, with one preapical light band. Hind tibiae pale yellowish, slightly darkened apically.

Length of body, δ 20 mm., φ 23 to 28 mm.

" " antennae, δ 8.5 to 9 mm., φ 9 mm.

" " head and pronotum, δ 7 to 7.2 mm., φ 7.8 to 8.3 mm.

" " tegmen, δ 21.5 to 22 mm., φ 24 to 26.5 mm.

" " hind femora, δ 10.2 to 11 mm., φ 11.5 to 12.2 mm.

Described from 3 δ and 2 φ . Moose Jaw, Ass'a, Aug. 30, 1897, 1 δ , 1 φ ; Waldeck, Ass'a, Aug. 30, 1897, 1 δ ; Morse, Ass'a, Sept. 20, 1897, 1 δ , 1 φ .

This species is found on the semi-arid plains of Assiniboia. Its flight is higher and slower than that of any other *Trimerotropis* I am acquainted with, resembling that of *Circotettix*, as does also the stridulation to some extent, which, however, is no louder than that of most species of its genus.

In conclusion, I wish to express my sincere thanks to Mr. Scudder for his valuable assistance in determining the material upon which this paper is based.

EXPLANATION OF PLATE I.

- Fig. 1. *Trimerotropis longicornis*, ♂, pronotum.
 " 2, " " ♂, face, front view.
 " 3, " " ♂, head and pronotum, from above.
 " 4, " " ♂, tegmen and wing.
 " 5, " *viniculata*, ♂, pronotum.
 " 6, " " ♂, face.
 " 7, " " ♀, tegmen and wing.
 " 8, " *huroniana*, ♂, pronotum.
 " 9, " " ♂, face.
 " 10, " " ♀, tegmen.
 " 11, " " ♀, tegmen.
 " 12, " " ♀, tegmen and wing.
 " 13, " " ♀, lateral view.
 " 14, " *sordida*, ♂, pronotum.
 " 15, " " ♂, face.
 " 16, " " ♂, head and pronotum.
 " 17, " " ♂, tegmen and wing.
 " 18, " " ♀, lateral view.

EULECANIUM LYMANI.

SIR,—Permit me to correct a slight error into which Mr. King has fallen in regard to the locality where I found the scales of *Eulecanium Lymani*, as the tree was not, as stated, at Quebec, but at St. Hilaire, a station on the line of the Grand Trunk Railway, about twenty-two miles east of Montreal. I shall be happy to send specimens of this scale to anyone interested in scale insects.

H. H. LYMAN.

WEST COAST AND OTHER JASSIDÆ (HOMOPTERA).

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Most of the material upon which the following descriptions are based belongs to the National Museum, and the species are here described at the request of the curator, Dr. W. H. Ashmead.

Eutettix pannosa, n. sp.—Resembling *saucia* and *scaber* in general appearance, smaller, darker, and with longer vertex and more generally reticulate elytra. Length, ♀ 4.5 mm., ♂ 4 mm.; width, ♀ 1.5 mm., ♂ 1.25 mm.

Vertex right angled, apex blunt, three-fifths as long as its basal width, two-thirds as long as the pronotum, half longer on middle than against eye, disc slightly sloping, flat, with the apex elevated. Face, retreating, forming an acute angle with the vertex, front rather broad. Elytra rather short, compressed at the apex, venation weak, irregularly reticulate, the second cross nervure sometimes present.

Colour: vertex and pronotum pale cinereous or milky, heavily and very evenly irrorate with brownish fuscous, except that the anterior margin of the vertex presents six more or less definite dark spots, and the lateral margin of the pronotum is narrowly lined with ivory white. Elytra with the inner halves resembling the pronotum in colour, the outer half on either side milk white, with more or less of brownish reticulation, especially along the costal margin. The brown area on the disc being heaviest along the margin, and shading out towards the suture, the milk white area being continuous with that on the margin of the pronotum and including the claval suture to just before the middle, when it narrows down obliquely to one-half the former width, and becomes obscured by the heavier reticulation toward the tip. Face closely and evenly irrorate with fuscous.

Genitalia: female segment twice the length of the preceding posterior margin, rounding with a rather broad, blunt, slightly bilobed median projection, surface of the segment depressed either side of this tooth; male valve triangular, narrower than the ultimate segment, and about two-thirds its length; plates long, triangular, apices acute, three times the length of the valve.

Described from eight specimens from the National Museum collection, "Los Angeles Co., California, Coquillett collector."

Eutettix fenestrata, n. sp. Form of *pullata* nearly resembling *jucunda*, but more clearly marked. Longer and narrower than either

species. Pale, irregularly maculate with brown; elytra with numerous milk-white spots. Length, ♀, 6 mm.; width, 1.5 mm.

Vertex with the margins almost parallel, two and one-half times wider than long, scarcely half the length of the pronotum; the disc sloping, but slightly depressed, transversely angled with the front, the margin thick and slightly produced. Front longer and narrower than in *jucunda*, the margins nearly straight. Elytra long and narrow, folded at the apex; venation similar to that of *jucunda*, the nervures stronger, central anteapical cell very long, narrow and nearly parallel margined through the median half, where there are three or four rather strong cross reticulations, both ends enlarged, the anterior the larger and somewhat irregular in shape, the posterior sexangular; the claval nervures tied before the middle and the outer one with a cross nervure to the suture.

Colour: vertex pale creamy yellow, a pair of crescentiform spots at the apex, and a pair of dots inside the ocelli black, a narrow transverse band back of these and parallel with the margin, dark at the ends, shading to brown at the middle and spreading out as a wash on the disc. Back of this band are three brownish ovals, the outer ones connected with the margins of the eyes by dark brown dots. Pronotum pale cinereous, with numerous fine irrorations posteriorly, and a few large dark ones on the anterior half. Scutellum orange, washed with brown, four ivory white points and two brown dots on disc. Elytra brown, the nervures still darker, a large number of milky white hyaline spots arranged in transverse bands, one including the first cross nervures, and a broader irregular one across the anteapical cells; the sutural margins darker, with three pairs of equidistant round spots interspaced by the white tips of the claval nervures; the reflexed nervures along the costa broadened and darker brown.

Genitalia: female segment but little longer than the preceding, posterior margin truncate next to lateral angles, the middle half obtusely angularly produced, the apex of which is again produced into a short strap-shaped tooth, not as wide as the ovipositor, its width and length about equal.

Described from a single female from Prof. Cockerell, taken in the Sierra Madre Mts., Mexico, by C. H. T. Townsend.

Eutettix palliolata, n. sp.—Superficially resembling *Thamnotettix areola*, but much broader. Pale lemon yellow, with the pronotum,

scutellum and a narrow sutural stripe extending to the apex of the elytra of a rich testaceous brown. Length, ♀ 6 mm., ♂ 5 mm.; width, 2 mm.

Vertex longer and flatter than is typical for the genus, over half as long as its basal width, two-thirds the length of the pronotum, half longer on middle than against eye; front broad, nearly flat above, meeting the vertex in an acute angle, the margin narrow; pronotum very broad and almost parallel margined. Elytra rather broad, broadly rounding at the apex; venation obscure, somewhat irregular, a number of veinlets to the costa.

Colour: vertex pale lemon yellow, sometimes slightly greenish and sometimes washed with brown; pronotum and scutellum cinereous, washed with brown or pale brown, with traces of cinereous lines; elytra creamy yellow, the scutellar and sutural margins back to the apex narrowly striped with testaceous brown. These stripes are often narrowly margined with white anteriorly, including a narrow lateral margin of pronotum, and contain light spots as follows: a dot at the scutellar angle, a half circle in the margin before the middle of the clavus, a dark-margined spot in an enlargement of the stripe towards the apex of clavus, and a dot or margined spot in each of the first three apical cells. The brown stripes are very narrow at the apex of clavus and then enlarge as the elytra overlap. Face and all below pale creamy yellow.

Genitalia: female segment twice the length of the preceding, truncate posteriorly with the median fourth produced into a blunt tooth half as long as its basal width and slightly notched at the apex; male valve short, obtusely rounding, plates together spoon-shaped, their apices bluntly rounding and slightly upturned.

Described from eight specimens from the Nat. Museum collection labeled "Tex."

This is a strikingly distinct species, and while not a typical *Eutettix* in the shape of the head, it seems best to place it here for the present at least.

Scaphoideus scrupulosus, n. sp.—Similar to *blandus* and *jucundus* in form. The elytra more flaring and with the general appearance of an *Eutettix*, except for the sharp angled vertex. Pale, with a brown band on base of elytra, another on tip, and a triangular saddle on the disc. Length, 5 mm.; width, 1.25 mm.

Vertex flat, acutely angular, its length and width about equal, a little longer than pronotum, twice longer on middle than against eye; face as

in *jucundus*. Elytra moderately long, the venation obscure, and somewhat reticulate in the brown areas, resembling that of *blandus*; costal margin with a large number of nervures as in that species, but in this case they are less regular and slightly oblique.

Colour: vertex pale creamy, sometimes entirely washed with orange fulvous. In clearly marked specimens with a dash each side the apex, a faint line next the margin, and an irregular crescent on the anterior disc. Pronotum milky, with a submarginal row of obscurely infusate spots anteriorly, and often a few irregular irrorations on the disc; elytra milky subhyaline, with a rather narrow basal band of pale brown, a triangular saddle occupying the posterior half of clavus, and extending out a little on to the corium, of a testaceous brown, often iridescent; the apex of the elytra, including all of the three inner apical cells, of a deep smoky or fuscous. The anterior white band is strictly transverse and parallel margined, and is very definite; only one or two of the principal veins show the brown markings across it. Back of this, however, there is more or less of brown reticulation, often enough to connect the dorsal saddle with the fuscous tip; costal veinlets fuscous; face lemon yellow, anterior and middle femora, except the apices, deep brown.

Genitalia: female segment nearly three times the length of the preceding, the lateral angles broadly rounding to the posterior margin, margin roundly excavate one-third the distance to the base; from this excavation a long strap-like tooth extends nearly half its length beyond the two rounding lobes of the segment. Male valve obtusely triangular, nearly as long as the parallel margined, ultimate segment; plates long triangular, two and one-half times the length of the valve, their apices slightly produced, and their margins clothed with long hairs.

Described from four females and a male from Los Angeles, Calif. Coquillett collector. Type—Cat. No. (?), U. S. N. M.

This is a strikingly distinct form in this genus, and in several respects suggests the *modesta* group of *Eutettix*.

Thamnotettix collaris, n. sp.—General appearance of *clitellaria*, the saddle longer and narrower, slightly larger and longer than that species, with a much longer and distinctly angled vertex. Length, ♀, 6 mm.; width, 1.75 mm.

Vertex bluntly conical, nearly twice as long on middle as against eye, half as long as its basal width; together with the eyes distinctly narrower

than the pronotum ; front narrow, the margins straight, elytra long and closely folded behind, venation indistinct.

Colour : vertex and face creamy yellow, a pair of approximate spots on the apex only partly visible from above, and a narrow basal line on the vertex black. Pronotum behind the eyes ivory white or slightly yellowish-white ; that part included between the eyes deep black, scutellum black, elytra black, an elongate saddle extending from the apex of scutellum to the apex of clavus, a yellow stripe along costal margin narrow at the base, gradually widening until it occupies half the corium, then abruptly terminating just before the apical cells ; face and all below yellow, the antennal sockets black.

Genitalia : female segment rather long, lateral angles slightly rounding, posterior margin triangularly emarginate, with a median strap-shaped tooth as in *clitellaria*, but shorter.

Described from a single specimen from New York City (H. C. Park).

Thamnotettix mendica, n. sp.—Form and general appearance of *belli*. Larger, and with a longer and more distinctly pointed vertex, with a pair of rather large approximate black spots at the apex. Length, ♀ 6 mm., ♂ 5 mm.; width, 1.75 mm.

Vertex a little over half broader than long, two-thirds longer on middle than against eye, apex slightly conically pointed ; front narrow, the margins straight, sloping directly to the clypeus ; pronotum over half longer than vertex. Elytra long, inclined to be flaring, venation distinct, similar to that of *belli* and *geminata*.

Colour : vertex yellow, a pair of large triangular approximate black spots on the rounding margin of vertex and front ; face pale lemon yellow, the sutures fuscous, a few brown arcs on front not extending up to the black spots. Pronotum white or greenish-white back of the eyes, anterior margin between the eyes brown. Elytra brownish subhyaline, with a coppery reflection, the nervures greenish-white, the costal margin before the apical cells broadly subhyaline white.

Genitalia : female segment half longer than the penultimate, the lateral angles rounding, posterior margin triangularly excavated one-third the depth of the segment. From the bottom of this excavation arises a rather broad strap-shaped tooth, which exceeds the lateral angles ; male valve rounding, nearly semicircular, almost as long as the ultimate segment ; plates three times the length of the valve, convexly rounding at the base, then concavely narrowing to the acute apices.

Described from five specimens from Fort Collins, Colo., collected by Mr. Van Duzee and the author, and two males from the National Museum, one from Santa Clara Co., the other from Los Angeles Co., Calif., both collected by Coquillett.

The longer and more pointed vertex will at once separate this from any of the numerous varieties of *belli*, *montana* and *geminata*.

Thamnotettix bullata, n.sp.—Somewhat resembling *chiragrica*, smaller and with a narrower head, irregularly pale and fuscous, a pair of large black spots against the eyes in front; elytra with the nervures broadly light. Length, 5 mm.; width, 1.6 mm.

Vertex two and one-half times wider than long, half the length of the pronotum, but little longer on middle than against eyes, roundly confused with the inflated front, which is broadest across the antennal sockets and abruptly narrows to the clypeus. Elytra considerably longer than abdomen, almost parallel margined, apex obtusely rounding, appendix narrow; venation distinct, the nervures broad, the central anteapical cell extending beyond the other two, and slightly constricted in the middle half.

Colour: vertex pale orange, four dashes on the apex of vertex and front, anterior pair the larger, and a pair of large round spots occupying the entire space between the ocelli and the eyes, black. Pronotum cinereous or milky, more or less irregularly blotched with fuscous; scutellum pale yellow, with two large triangular spots within the basal angles. Elytra sprinkled with brownish fuscous, the nervures broadly white, emphasized on some of the cross nervures; face pale yellow, a few arcs on front brown; antennal sockets and narrow sutural line black; legs and below pale yellow, the ovipositor black.

Genitalia: female segment about half longer than the penultimate, the posterior margin slightly emarginate on either side of a broad median lobe that about equals the slightly acute lateral angles.

Described from three females from Los Angeles Co., Calif.; Coquillett collector. Received from the U. S. Nat. Museum.

This is another of the broad-headed species of *Thamnotettix*, which like *atridorsum* and *chiragrica* are not typical of the genus, and at the same time do not seem to be well placed in *Athysanus*.

Thamnotettix languida, n. sp.—Form of *Kennicotti* and *Coquilletti* nearly, but with a longer vertex and broader form. Darker than *Kennicotti*, with a pair of black spots just over the margin of the vertex and

another pair on the base, a submarginal row on pronotum and a basal row on scutellum. Length, ♀ 6 mm., ♂ 5 mm.; width, almost 2 mm.

Vertex one-half wider than long, half the length of the pronotum, the margins nearly parallel, the apex very slightly conically produced; face but slightly inclined, forming nearly a right angle with the flat, slightly sloping vertex; front broad below, abruptly narrowing to the clypeus; elytra rather broad, compressed behind, giving a wedge-shaped appearance to the insect; venation obscure, similar to that of *Kennicotti*.

Colour: vertex yellow, sometimes washed irregularly with brown, a pair of dashes on base of front visible from above, and a pair of round spots at base black. Pronotum varying from pale or milky to olive fuscous on the disc, the anterior fourth pale yellow, with an irregular band of black spots. Scutellum yellow, with a pair of round dots between a pair of larger triangles of black on the base. Elytra brown or brownish fuscous on the disc, shading out to subhyaline towards the margins posteriorly, the nervures lighter, the claval nervures milky, with the outer part becoming broadly so towards the apex; face pale yellow, a few brownish arcs on the upper part of front below the black dashes, and sometimes a line on clypeus.

Genitalia: female segment nearly twice as long as the preceding, but somewhat narrower, whole segment in the form of a parabolic curve, a second membrane appearing from under the lateral margins and extending back two-thirds the length of the segment; male valve very obtusely triangular, as wide but not over half as long as the apical segment; plates large, broader than the valve at base, and over four times as long, regularly narrowing from just beyond the base to the bluntly rounding apices; margins thick and clothed with weak hairs.

Described from eleven specimens from Los Angeles Co., Calif.; Coquillett collector. Received from the U. S. Nat. Museum.

This species seems to combine in part at least the characters of two different groups in *Thamnotettix*, for while in many ways it resembles *Kennicotti*, in other characters it is allied to some of the green species.

Errhomenellus irroratus, n. sp.—Smaller than *maculatus*, which it much resembles. Stouter bodied, and with a fuller front and more rounding head. Dark brown, irregularly dotted with pale yellow. Length, ♀, 6 mm.; width, 2 mm.

Vertex slightly less than a right angle, the apex blunt, almost twice broader than long, over twice longer on middle than against the small eyes; disc slightly convex, separated from the convex front by a sharp, slightly-curved carina; ocelli a little over their own width back of the carina, and about midway between apex and eye. Front broad, convex in both diameters, clypeus long, its depressed semicircular apex extending beyond the genæ. Pronotum transverse, about equalling length of the vertex, slightly emarginate on the median half posteriorly. Elytra brachypterous, but little longer than the pronotum, truncate or slightly rounding behind, coriaceous obscuring the venation.

Colour: dark reddish brown, vertex irregularly maculate with numerous small, round, yellow spots; pronotum and scutellum with numerous irregular yellow spots. Sometimes a pair of irregular yellow stripes ending on the outer angles of the scutellum. Elytra very sparsely maculate, an irregular blotch on the apical margins just within the costa; abdomen with numerous small spots and a pair of irregular longitudinal stripes yellow; face almost piceous with numerous fine yellow dots.

Genitalia: female segment large, nearly twice longer than penultimate, the posterior margin truncate within the triangularly produced lateral angles, a narrow median incision, back of which the segment is distinctly carinate.

Described from two females from Siskiyou Co., Calif.; collected by Koebele. Received from the U. S. Nat. Museum.

PAGARONIA, n. gen.

Allied to *Errhomenellus* and *Tettigonia*, but with a narrower head than in either. Resembling *Ciccus* in shape of head and pronotum. Head distinctly narrower than pronotum, the eyes small, vertex conical, nearly as long as the pronotum; the front reflexed over the margin as in *Tettigonia*; ocelli small, on the vertex just back of the suture that marks off the reflexed front, and one-third the distance from the eye to the apex. Pronotum short, emarginate behind, angularly inserted between the eyes, the lateral margin carinate, broadening posteriorly in a curve continuous with that of the anterior margin. Elytra longer than the abdomen, venation simple, usually but one anteapical cell—the outer. Face long and narrow, clypeus extending beyond the margin of the genæ; anterior tibiæ simple.

Pagaronia 13-punctata, n. sp.—Green, with thirteen small black spots on head and pronotum, and pale red lines on the elytra. Length, 8–9 mm.; width, 2.25 mm.

Vertex acutely conical, one-fifth wider than long, five-sixths the length of the pronotum, disc flat, sloping slightly toward ocelli, slightly carinate behind, the carina angled near the eye on either side and extending back behind it; pronotum broadest across lateral angles, lateral margins as long as the eye, posterior margin rounding from lateral angles to the scutellum, then emarginate. Elytra longer than the body and rather broad; venation simple, the apical cells twice longer than broad; front much inflated transversely, but slightly narrowing to clypeus.

Colour: pale green, vertex with seven black spots as follows: a pair on the basal suture, a pair just outside and behind the ocelli, a spot on either side the apex and one just before the middle of the disc. Face green, a black spot just under the conical apex of vertex and a pair of smaller ones, often obscure, on the suture just below the ocelli. Pronotum green with three black spots in a row across the disc, the outer pair on a line behind the eyes, the median one behind the middle of the pronotum. Elytra greenish subhyaline, sometimes with pale reddish lines between the nervures.

Genitalia: female segment as long as the penultimate, the posterior margin very slightly produced, elevated in the middle, almost carinate, often giving the appearance of a slight notch; male valve usually entirely concealed, plates long and finger-like, three times as long as their combined basal width, over twice the length of the apical segment, narrowing toward the apex and sparsely clothed with weak spines.

Described from nine specimens from Los Angeles Co., Calif. (collected by Koebele and Coquillett); three from Pasadena, Calif. (H. C. Fall), and three from Marin Co., Calif. (C. Fuchs).

Pagaronia 13-punctata, var. *triunata*, n. var.—Size and structure of the species: Colour dirty straw yellow, sometimes washed with reddish; vertex with all seven spots of the preceding species enlarged and somewhat irregular, the posterior pair on the disc near the margin instead of being in the suture, an elongate dash on the reflexed portion of front on either side, about midway between the apical spots and the pair

against the ocelli. Front with twelve pairs of distinct fuscous arcs which emit a broad definitely-margined stripe of yellow bearing a black spot above. Pronotum with a submarginal row of irregular spots, heaviest near the margin. Elytra sometimes of a unicolorous dirty straw, sometimes pale yellow, with the spaces between the nervures scarlet, except along the costa.

Described from four specimens from Santa Clara Co., Calif. (Coquillett), and three from Santa Cruz Co., Calif. (Koebele).

This is a very puzzling form and seems in several characters to connect the *Tettigonide* with the *Jasside* through some of the lower forms in that group.

Paropulopa interrupta, n. sp.—Form of *M. scanicus* nearly, slightly smaller, vertex flat and not extending behind the eyes; colour very variable, usually pale straw with interrupted fuscous markings on pronotum and elytral nervures. Length, 2.5–3 mm.; width, 1.25 mm.

Vertex flat or slightly depressed on the disc, deeply, coarsely pitted, a little over twice as long on middle as next eye, two and one-half to three times wider than long, the anterior margin rounding or bluntly angulate, face retreating, forming a very acute angle with vertex. Front flat, slightly depressed above, broadest across the antennal pits, from which ridges extend nearly to the apex, forming shallow pits between these and the vertex margin in which the ocelli are located. Whole face deeply pitted, ocelli slightly nearer each other than the eyes, clypeus rounding at the apex and extending some distance beyond the genæ. Pronotum with the entire posterior margin nearly straight, anterior and lateral margins in a broad curve. Elytra coriaceous, apex bluntly angular, nervures raised, distinct, cells somewhat irregular, often a few extra nervures along costa, a cross nervure between the sectors before the anteapical cells and often two behind this opposite the anteapical cells.

Colour: very variable, often pale straw, with more or less of fuscous markings on pronotum and with the nervures and margins of elytra interruptedly fuscous, sometimes these marks are arranged in the form of oblique bands. Sometimes the whole insect is of a rather uniform brownish fuscous and sometimes of a tawny reddish shade, the punctures on pronotum are usually dark marked.

Genitalia: female segment shorter than the penultimate, the posterior margin triangularly emarginate from the lateral angles clear to

the base in the middle, so that all that is visible of this segment is a triangular strip on either side from under the margin of which another more broadly triangular strip is exposed; male, ultimate segment very large, valve transverse, one-half as wide and one-third as long, the posterior margin truncate, plates as wide as the valve and nearly four times as long, apparently united for more than half their length, the apices broad and individually rounding.

Described from nine specimens from Los Angeles Co., Calif. (Coquillett and Koebele), and four specimens from Pasadena, Calif. (H. C. Fall).

This, and the following species, introduce a new subfamily into the American fauna. It remains only to discover a *Ledra* and a *Ulopa* and we shall have all the European groups represented.

Paropulopa Mexicana, n. sp.—Resembling *interrupta*, but larger. Front distinctly convex, elytra long and narrow. Pale testaceous brown with fuscous pitting. Length, 3.5 mm.; width, 1.25 mm.

Vertex slightly longer and more angular than in the preceding form, fuller and less sharply angled with the vertex. Front full and distinctly convex, a slight depression under the apex of vertex, the carinae under the ocelli very faint. Pronotum shorter and broader than in *interrupta*, the posterior margin straight. Elytra long, regularly tapering from both margins, coriaceous, the claval suture often indistinct; the venation similar to *interrupta*, but weak and irregular posteriorly, no cross nervure between the sectors before the anteapical cells.

Colour: testaceous brown, with more or less of fuscous on vertex and pronotum, chiefly in the coarse pits.

Genitalia: female segment two and one-half times the length of the penultimate, the lateral margins parallel to the middle, then suddenly narrowed one-fourth the width of the segment and again parallel; posterior margin truncate or roundly emarginate, with an open median notch.

Described from two females from the Sierra Madre Mts., Chihuahua, Mex. Alt. about 7,500 ft. Collected by C. H. T. Townsend, and sent by T. D. A. Cockerell.

NOTES ON THE LARVÆ OF *ARCTIA VIRGO*, LINN.

BY ARTHUR GIBSON, DIVISION OF ENTOMOLOGY, CENTRAL EXPERIMENTAL FARM, OTTAWA.

In Dr. Dyar's "Preliminary Notes on the Larvæ of the Genus *Arctia*" (Jour. N. Y. Ent. Soc., March, 1900), some interesting remarks are made in reference to the larvæ of *Arctia virgo*, as to the stage in which the larvæ hibernate, and if they ever possess a dorsal stripe.

Through the kindness of the late Mr. T. G. Priddey, of Toronto, we received on the 10th April, 1901, three larvæ of *A. virgo*, collected by him on the 5th April. Writing under date of the 8th April to Dr. Fletcher, Mr. Priddey says: "I shall probably get more larvæ, but even now the bank under the grass where they hibernate is quite solid ice." The three specimens only moulted once before maturity, viz., on the 26th April, 30th April, and 8th May, respectively; so these, at any rate, hibernated in the penultimate stage. Mr. Dwight Brainerd tells me that "at Montreal, *A. virgo* generally hibernates in its second to last skin; that is, it sheds its skin twice in the spring before going into pupation." He also states that he has found specimens in the fall in the penultimate stage. In the Annual Report of the Entomological Society of Ontario for 1896, on page 13, Dr. Fyles mentions that in the spring of 1891 he collected larvæ of this species at South Quebec, which moulted on the 4th May and again on the 20th May, the moths emerging on the 10th July.

With regard to the dorsal stripe, the following description of the full-grown larva, with the appended notes, will show that all the three specimens received from Mr. Priddey possessed this character:

Length, just after last moult (30th April, 1901), 35 mm. Beautiful deep black larva, with bunches of stout black bristles from tubercles on dorsum, and reddish bristles from tubercles on lower portion of sides and on venter, and a striking dorsal stripe of bright yellow distinct on all segments but 2 and 13. Head 3.6 mm. wide, shiny black, with lobes full, slightly furrowed at vertex, sparsely covered with short and long black hairs; mouth-parts and ocelli black; antennæ reddish-brown. Whole skin of body deep velvety black. Tubercles conspicuous, bearing bunches of distinctly barbed bristles. The bristles from tubercle iv and from all tubercles above spiracles are deep black. On most segments the majority of the bristles from tubercle v are bright rust-red, those from the upper portion of tubercle only being black. The

bristles from all tubercles below v are bright rust-red. Tubercle i about one-half the size of ii; ii has a shining base. Tubercles i, ii and iii are black, iv behind and almost touching the spiracle very slightly reddish, v and vi distinctly reddish, vii and viii on venter black. Spiracles yellowish-white. The thoracic feet are shiny black outside, lighter inside, tipped with pale brown and bear black and light-brownish bristles. The prolegs are brownish-red, and bear many rust-red bristles. On segment 2 there are several long thin hairs, not barbed, which slope forward and hang down in front of the head. On segments 11, 12 and 13 are also some long hairs, which are faintly barbed.

Two days after moulting the spiracles had changed to a bright orange. Five days after moulting the dorsal stripe was less conspicuous, being quite bright on and near middle of each segment, but faint (whitish) near division of segments. Eleven days after moulting the dorsal stripe was creamy white, expanded somewhat in the middle of each segment.

Length of mature larva 55 mm., extended 60 mm.; width at widest part, 8.5 mm.

Two other specimens of the mature larva differed somewhat from the one from which the above description was drawn. This difference was chiefly in the colour of the tubercles. In one of the specimens, tubercles iv, v and vi were partly whitish, vii and viii being black as above. In the other specimen, tubercle iii on abdominal segments, dorsal tubercles on segments 3 and 4 and tubercles vii and viii were all reddish. In this latter specimen tubercle ii, which was black, changed to reddish on all segments but 11, 12 and 13. The dorsal stripe was distinct in both of these specimens, in the one case the colour being a dirty whitish, and in the other a beautiful orange-yellow, distinct on all segments. On segment 2 in this latter specimen the bristles from the front half of the dorsal tubercles were bright rust-red, the same as those from tubercles below spiracles, as well as nearly all the bristles from lower half of tubercle iv, and the median suture of head was white.

Mr. R. J. Crew, of Toronto, who has bred *A. virgo*, tells me that about half of all the larvæ he reared had the dorsal stripe. Mr. Brainerd has also found the dorsal stripe to be common, and states that "a larva of *A. virgo* with red spiracles in one skin will often have them jet black in the next."

On the morning of the 16th May one larva began to make its cocoon, which was very slight, being simply some leaves drawn together and fastened by a few threads of silk. By the morning of the 22nd May the larva had changed to pupa. Another began to spin on the 22nd May,

and by the 29th had changed to pupa. The third specimen was inflated. The first moth emerged on the 15th June, and the second on the 20th June. At Ottawa the moths have been taken during the second week of July, and at Toronto the writer has collected specimens at the electric lights about the same time.

Pupa.—Length, 29 mm.; width at widest part, 10.75 mm.; black, yellowish-brown in folds of abdomen, pruinose, as if the pupa had been heavily frosted—whole surface roughened. Abdomen and thorax sparsely covered with short black bristles. Spiracles black, shiny, conspicuous. Cremaster rough, shiny at base, hollowed below, bristles capitate, reddish brown. The pupa when first formed is reddish-yellow on dorsum of thorax; wing-cases dull yellow. The ground colour of the abdomen is reddish, the segments are ringed with black, and in folds of segments there is much white.

DR. HERMAN STRECKER.

Dr. Herman Strecker, a widely-known sculptor, and one of the leading entomologists of America, died on the morning of Nov. 30, at his home in Reading, Pa.

He was stricken with apoplexy on the evening of the 29th of November, and passed away without regaining consciousness. He was in the 65th year of his age.

Dr. Strecker was of German descent, and was born in Philadelphia, March 24, 1836. He inherited his fondness for scientific studies, and evinced this inclination at an early age. On his mother's side were three naturalists of note. They were Benjamin, Edward and Richard Kern.

He was an architect, designer and sculptor by profession. He located in Reading when a boy, having accompanied his father, who was a prominent dealer and worker in marble, at that time. Since then he followed the pursuit of his father. As a sculptor he gained a wide and enviable reputation. He produced many praiseworthy works of art.

He began his work as an artist and sculptor in his 12th year, and laboured hard ever since. All his literary and scientific work, the immense correspondence attending the making of his collection, was done at night, his vocation as a sculptor taking up his daylight hours.

He travelled a great deal, and in 1855-56 visited many islands in the West Indies. He also travelled in Mexico and Central America, to examine the old Aztec monuments, as well as to add to his collection.

Dr. Strecker was one of the most eminent authorities on the Lepidoptera in America. He was well versed in some of the dead languages, and a master of many living foreign tongues, in which works of his special pursuit are written. He owned the largest, most remarkable and in every way the most valuable collection on the American continent. It is said that there are but few in the world that surpass it. The Strecker collection contains over 200,000 specimens, gathered from every portion of the globe.

In consideration of his scientific work and knowledge, the degree of Ph. D. was conferred upon him by Franklin and Marshall College.

In his earlier days Dr. Strecker made frequent trips to Philadelphia, studying at the Phila. Acad. of Nat. Sciences all branches of natural history, but later devoted all his time to entomology, and finally to macro-lepidoptera.

He published numerous works on Lepidoptera, for which he drew and coloured the plates himself. His principal work, long out of print, was "Native and Exotic Butterflies and Moths."

He published the work under difficult circumstances; he was a poor man at the time. He saved sufficient money to buy a lithographic stone, and then drew the group of butterflies on the first page of the work. This was sent to Philadelphia, printed and then returned. When the stone came back he repolished it and drew upon it another group. In this way the stone travelled to and from Philadelphia, until all the plates were published. All the copies were sold. The demand increased, but no more were ever issued.

The collection is contained in many glass-covered drawers, and each specimen is labelled as to locality, etc. The collection cost many thousands of dollars. An attempt to describe the collection would be useless, but many extremely rare and valuable flies are contained therein. Upwards of 300 types and an equal number of co-types are in the collection. It is one of the most remarkable collections in the world in regard to aberrant and dimorphic forms.

Dr. Strecker was constantly visited by men of science from all parts of the world.

In his social relations he was cordial and affable, a genial friend and a good neighbour. He was reserved and unassuming in speaking of his own achievements. In his chosen field he ranked deservedly high.

The scientific world loses one whom it can ill spare. He left a widow, son and daughter.

LEVI W. MENGEL, Reading, Pa.

SYNONYMIC NOTES.

BY HENRY H. LYMAN, M. A., MONTREAL.

In 1834 Dejean proposed the name *Euchætes* for a genus of Coleoptera, and it had thus been preoccupied for seven years when Harris used it in 1841 for the moth named by Drury, *Bombyx Egle*.

In 1858 it was used for a third time by Scater for a genus of birds, and in 1876 Leconte described another genus of Coleoptera under this same much-used name.

As it is a well-known rule of nomenclature that a generic name can be used only once in the animal kingdom, all subsequent use of the term for other genera is erroneous and must cease.

It therefore becomes necessary to give other names, and I propose the name *EUCHÆTIAS*, from a kindred Greek word, for the genus erected by Harris. It is not necessary for me to define the genus, as it is well known, and this is merely a necessary change of name, the type, of course, being *Egle*, Drury.

For the genus erected by Leconte, I would suggest the name *EPEUCHÆTES*, the type being *Echidna*, Lec.

Leconte's genus was described very fully, in Proc. Amer. Phil. Soc., XV., 319, and the type species on page 320.

In view of what I said in my first presidential address on the subject of changes in generic names, it is perhaps the irony of fate that it should fall to my lot to myself make changes of this nature, but I can at least plead in extenuation, as the woman in the story did of her baby, that they are only very little ones.

Recently, in working over my Notodontidæ I made a rather curious discovery, namely, that the true *Angulosa*, S. & A., is the species which stands in our catalogues as *Georgica*, H.-S. On plate 83, which, by the way, in the English page of the text is erroneously numbered LXXVIII., are shown two moths, a ♂ and ♀, the former of which can only represent *Georgica*, while the latter is doubtless intended for the species which we have been calling *Angulosa*, as its larva feeds on oak, though it really, in my copy at least, looks more like *Ferruginea*, Pack., the larva of which, however, feeds on birch. But this ♀ is figured merely as a colour variety of *Angulosa*, as in the text it is said "the female in the figure is a variety of colour, most of that sex being coloured like the male."

It therefore necessarily follows that the male of the plate, and its proper female, which is described, but not figured, is the true *Angulosa*, S. & A., of which *Georgica*, H.-S., is a synonym, and that what we have called *Angulosa* has never been properly described and named, but as these moths have been so long known under these names, it is probably best to allow them to stand as they are, as no injustice is thereby done, and the female of the species now known as *Angulosa* was figured by Smith and Abbot, though erroneously, under that name.

THE SCIENTIFIC NAME OF THE CHERRY FRUIT-FLY.

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In September, 1899, I published an account of a new cherry pest, which I called the cherry fruit-fly (Bulletin 172, Cornell Experiment Station). As stated on pp. 31 and 32 of this bulletin, the identity of the adult insect had not then been established, although the evidence strongly indicated that it was the fly known as *Rhagoletis cingulata*, Loew. I kept my breeding cages containing the hibernating puparia of the insect in the warm greenhouse or insectary all winter, and on March 9th, 1900, the first cherry fruit-fly emerged. It did not disappoint my expectations, for it demonstrated beyond further doubt that this new cherry-fruit pest is *Rhagoletis cingulata*, Loew. By May 31st nine more of the flies had emerged, and then cherries near the insectary were nearly half grown. The flies continued to emerge until July 11th in my cages, and on June 30th I received word from Geneva that they were abundant about the trees where the fruit was ripening. This correspondent caught quite a number of the flies with sticky fly-paper hung on a shingle in a tree; he said they seemed to be attracted to any bright-coloured thing like a new straw hat.

Since the Bulletin was written, I have received evidence to indicate that the pest had been destructive during the preceding three to five years at Bonaparte, Iowa; Westboro, Mass.; State College, Pa.; Batavia, Syracuse, Portland, and Cataaugus, N. Y. Correspondents at Westboro, Mass., and Clifton Springs, N. Y., think that the same insect worked in their cherries at least thirty-five years ago.

Considerable damage was done by the insect in New York in 1900, but we heard little of it in 1901.

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